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# SCIENCE NEWS LETTER



®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



## Eye-Deceiving Jet

See Page 101



A SCIENCE SERVICE PUBLICATION

## METEOROLOGY

# Must Reclaim Dutch Lands

**Flooding of European lowlands means long and costly reclaiming of farm soil by ion exchange process. Catastrophic storm was result of unscheduled rendezvous near Iceland.**

► HUNDREDS OF acres of Dutch farm lands will have to be reclaimed from the salt waters of the North Sea, an expensive process.

Fundamentally it will be a chemical process whereby the sodium of the sea salt, sodium chloride, will be replaced by calcium. The process is known as ion exchange.

When the dikes broke and the salt water flooded the rich lands, the sodium in the sea salt, by a process of ion exchange, replaced calcium in the land. The salt itself is less likely to invade the earth in toxic quantities, experts said.

Now this process will have to be reversed. The dikes will be repaired as quickly as possible. Then pumping will begin. Many pumps were built after the dikes were broken during World War II. How many of these withstood the storm and the waters, and how many can be repaired quickly is of vital importance in the reclamation job.

Once the salt water is pumped out, fresh water will be pumped through. Gypsum, or calcium sulfate, will be spread over the land. The calcium, through the process of ion exchange, will change places with the sodium and the land will be made fresh and fertile again.

During the process, care will have to be taken that the earth does not puddle, that is, become sticky when it is wet and hard as concrete when it is dry. Straight lime can do this job.

The Dutch learned centuries ago how to make fertile the land reclaimed from the North Sea. But it was only 40 years ago that a Russian soil chemist named Gedroiz found the chemical process involved. Now the Dutch have many soil scientists.

The devastation of so much of the lowlands was caused by the unscheduled rendezvous near Iceland of an extra-tropical cyclonic storm, born north of the Azores, and a high-pressure anticyclonic area, born near Thule Air Base in Greenland.

The meeting of these two storms generated the terrific winds which built up the flood in England and the European lowlands at the end of January.

The low, which was first noticed on the map near the Azores during the week of Jan. 25, was not unusual. It was weak, probably never would amount to much. The high, born over the icy wastes at the top of Greenland, was more unusual and therefore more noticeable. It prevented any storms which are always revolving counterclockwise around lows from moving out into the Atlantic from over North America. The anticyclonic high blocked

any movement westward of air across the Atlantic.

Between Friday and Saturday, Jan. 30 and 31, this high moved to Iceland. The low, still weak, approached Iceland from the south on Friday. Abruptly, from Friday to Saturday, stopped by the high, it then turned about and began to move south-eastward toward the North Sea.

The relatively weak winds moving from the north around the low on its west side were strengthened by winds moving from the north around the high on its east side. The low moved east of the high and the two streams of north winds came together, becoming terrifically strong. The strong winds pushed the waters of the North Sea. These billions of tons of water struggled to get through the narrow English Channel.

But, just as a funnel overflows if you pour too fast into it, so the water overflowed the coasts of England and the hard-won, below-water-level farm lands of Holland. Thus, out of a rendezvous between a high and a low off Iceland came tragedy for thousands.

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## RADIOLOGY

## Three-Dimensional X-Rays

► THREE-DIMENSIONAL X-RAY motion pictures, marking a new milestone in medical diagnosis and research, have been achieved by radiologists at the University of Rochester, N. Y., Medical School.

The new process, announced as the first such, gives a much better picture of actual conditions inside the body and of the relative positions of internal organs. It requires no modification of the existing cinefluorographic camera. The film produced can be used for conventional, as well as stereoscopic, motion picture projection.

The pictures are expected to be of special value in the study and diagnosis of congenital heart disease, in which the heart is sometimes transposed from its normal position or where there is abnormal overlapping of heart chambers or vessels, as well as in joint and chest diseases. The process is now ready for clinical trials.

The special apparatus was developed by Sydney A. Weinberg of the University of Rochester Medical Center, assisted by Dr. Raymond Gramiak. The project was supported in part by U. S. Public Health Service funds under the direction of Drs. George H. Ramsey and J. S. Watson.

One camera, either a 35 mm. or 70 mm.,

## • R A D I O

Saturday, Feb. 21, 1953, 3:15-3:30 p.m., EST.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Winners of the 12th Annual Science Talent Search for the Westinghouse Science Scholarship will describe their projects, speaking from various parts of the country.

## MEDICINE

## Men Chief Victims Of Cluster Headache

► A NEW kind of headache, called "cluster" headache, was announced by Dr. E. Charles Kunkle of Duke University at the meeting of the American Federation for Clinical Research in New Orleans.

Men are the chief victims.

The headaches come in "clusters" of from one to five a day for weeks or months. The headaches themselves are usually brief, often lasting less than 30 minutes. Nasal congestion on the same side as the headache, reddening of the eyeball and watering of the eye are common accompanying symptoms.

Treatment has been difficult and results inconclusive, Dr. Kunkle said. No cause has been found but enlargement of sensitive arteries either inside the skull or on its surface is suspected as the cause.

"Cluster" headache is allied to migraine, he said, but differs from it in lack of warning signals, rarity of nausea and vomiting and the briefness and closeness of attacks.

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is used to photograph the subject. The stereoscopic effect is obtained by a moving X-ray tube synchronized to move in an arc maintaining the position of the X-ray beam on the subject. The moving X-ray tube, and the synchronized rotation of the subject on a revolving chair operated by an electric mechanism, give the necessary image shift to create the binocular effect necessary for stereoscopic visualization of the image.

Two prints of the film are made, and are run through two standard motion picture projectors that are mechanically linked to run synchronously. The images are projected through polaroid filters on to a metallic-surfaced screen, and viewed through polaroid glasses.

The new process augments the conventional one-plane X-ray motion picture apparatus developed at the University of Rochester several years ago.

Another important study now being carried on at the Rochester Medical School with the aid of cinefluorography is on the mechanism of swallowing, a subject on which there is considerable medical disagreement.

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## PUBLIC HEALTH

# Oppose Doctor Speed-Up

Forecast doctors, on basis of experiences during war, will oppose speed-up in training of medical students that President's Committee is expected to recommend.

► THE PRESIDENT'S Health Resources Advisory Committee is expected to recommend a speed-up of the medical school course to get more doctors trained for the Armed Forces, SCIENCE SERVICE has learned.

This will bring immediate opposition from deans of medical schools all over the nation, but not because they want a slowdown or easier medical training. This opposition will come because of the great fear that medical education will be set back by a so-called speed-up.

It's just a medical fact that the educational process needs time and some of what has been called "divine idleness" to really operate.

Doctors cannot be made, the medical deans know, by cramming information into young heads 12 months every year. The students need the eleventh month out of every 12 for complete freedom from studying. Without it they may crack up. Experience with shortened, speeded courses during World War II showed that after a year and a half the medical students had become "rebels," as one authority put it.

They were sloppy, careless and unable to do good work.

Medical school deans will be insisting on vacations for their students not with the idea of vacation good times for young men and women, but to give them leisure to assimilate what they have learned.

H. A. Overstreet, author, educator and philosopher, called attention to this need for leisure in the educational process in his book, "The Mature Mind."

"The process of psychological maturing," he wrote, "is more than the process of receiving impressions, one after another. It is the process of savoring these impressions until they yield up their meaning. It is the process of letting new experiences turn around and around in the mind until they find the angle at which they want to settle down among old experiences."

Medical students need to acquire psychological maturity as well as knowledge of diagnostic tests and disease remedies.

If we do not give them time for some "divine idleness" we may in ten years have medical artisans, carpenters and plumbers

as doctors themselves would say, but no real physicians, and no men and women capable of doing good medical research for ways to save and lengthen human life.

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## SURGERY

## New Stomachs for Old Successful in 20 Cases

► SUBSTITUTE STOMACHS have been provided approximately 20 persons through a new surgical technique developed by doctors at the University of California at Los Angeles Medical School and the West Los Angeles Veterans Administration.

The surgical technique was designed for cases in which cancer of the stomach demanded complete removal of the stomach, and in some cases, parts of other abdominal organs. It was developed by Drs. John M. Beal and William P. Longmire.

The operation involves removal of a segment from the upper portion of the small intestine (jejunum) and transplanting it between the esophagus and the duodenum.

In all cases the new stomach has appeared to be adequate, and the operation is much simpler and less hazardous than other surgical techniques designed to provide substitute stomachs.

Providing a substitute stomach after removal of the organ is not always necessary, said Dr. Beal. Many patients adjust themselves eventually to a normal mode of living without a gastric reservoir.

However, those patients provided with substitute stomachs by the new technique seem to adjust more rapidly and without the marked lack of capacity for food, upper abdominal distress and inability to regain their former weight that often characterize the adjustment period.

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## BIOCHEMISTRY

## Antibiotic Available For Amebic Dysentery

► FUMAGILLIN, AN antibiotic or so-called mold remedy specifically effective against the germs of amebic dysentery, is now available for doctors to use in treating patients with the intestinal form of the disease. Capsules of it to be swallowed are being put on the market by Abbott Laboratories, North Chicago, Ill.

The antibiotic was originally isolated from an Aspergillus organism by Drs. F. R. Hanson and E. Eble of the Upjohn Company, Kalamazoo, Mich. Its first promise of becoming good medicine for amebic dysentery has now been followed by reports of good results in more than 200 patients. (See SNL, March 3, 1951, p. 133.)

The drug is unusual because it does not act against the bacteria normally found in the intestinal tract nor against viruses and fungi, but only against amebas, the germs that cause amebic dysentery.

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**ROCKETS FOR FRONT LINES**—A Marine helicopter prepares to unload a rocket launcher at a site somewhere along the First Marine Division front in Korea. Supplying combat units by helicopter is part of a vast land, sea and air transportation service that must deliver about a ton of supplies to each front-line man every 30 days.

## METEOROLOGY

# Test Mountain Winds

To discover how world's glider record was achieved, a moving mountain in a ten-foot tank has been set up. Another model will aid study of atmospheric temperature differences.

► OTHER THINGS than faith are moving mountains. In a laboratory at Johns Hopkins University, Baltimore, a model of the mountains of the Sierra Nevada range near Bishop, Calif., is being moved back and forth to try to discover how the world glider record of 45,000 feet was achieved in wind currents set up around the mountain.

This work was revealed by Dr. Robert R. Long at the American Meteorological Society meeting in New York. His moving mountain is in a tank ten feet long, two feet high and five inches wide. The air around the mountain is represented by layers of three different fluids, the bottom fluid being heaviest and the top lightest in weight.

Not only does he hope to discover how the fast-moving vertical wind current that can take a glider up to 45,000 feet is set up near the mountain, but also he hopes to find out some of the seasons for the different kinds of turbulence around such mountain chains as the Rockies, the Andes and the Himalayas.

Dr. Long's mountain, a smooth round object, is moved back and forth along the bottom of a channel. Thus, relatively, the liquid atmosphere is moving against the mountain. The denser "air" in the bottom

moves up and over the top of the mountain, then it tumbles down the other side, gathering speed as it goes.

Down at the bottom it is in a highly unstable condition, and sometimes takes what is called a hydraulic jump, extending high into the troposphere about 40,000 feet. The faster the air speed across the top of the mountain and the less dense the air near the ground, the better chance there is for a terrific hydraulic jump. From observation of these jumps in the laboratory will come new knowledge of how our weather is generally affected by mountain chains.

At the University of Chicago, Dr. Dave Fultz is getting ready to measure temperature differences in a model of the atmosphere of the entire Northern Hemisphere. The model, with a radius of seven and one-half inches from the "North Pole" to the "equator," shows a change in temperature of about 10 degrees Fahrenheit, a big jump in such a small space.

By measuring temperature differences at various places in his model, Dr. Fultz hopes to find out more about how cold air moves down from polar regions in the winter, and warm air moves up from the equator during the summer.

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## AGRICULTURE

# 3 Tons for Each Person

► AMERICAN LIVING standards require almost three tons of products from farms and forests each year for every man, woman and child in the nation.

To meet the constant and growing demands on agriculture to supply enough food and fibers for the American people, the resources of science have been called into play on an enormous scale.

The annual report of the U. S. Department of Agriculture's Bureau of Plant Industry, Soils and Agricultural Engineering is a veritable encyclopedia of advances in the science of agriculture. The report lists some 50 new and improved crop varieties released during the year, including varieties resistant to disease, with higher yields and with wider growth ranges.

Among the long-term advances of science in agriculture are the development of hybrid corn; the use of more and better fertilizers; the coming of DDT; production of disease-resistant varieties of plants; use of mechanization, electricity, and soil conservation techniques.

Scientists have their job cut out for them in their search for new ways to increase American agricultural production, in the race between food supply and population increase. Here are some of their points of attack:

(1) Insect damage and disease destroy billions of pounds of food and fibers each year. Insects cost the U. S. \$4,000,000,000 a year in crops and livestock. Ten percent of all farm animals are lost to disease and parasites. Science must find new weapons against these enemies.

(2) Ways to use fertilizers more effectively must be found. Farmers use \$1,000,000,000 worth of plant nutrients a year to get present production. But scientists admit that the full benefit of fertilizers is not obtained because of lack of knowledge about how they work.

(3) New varieties of plants and animals with high food yield and resistance to disease, adverse weather and soil conditions must be developed.

(4) Chemistry must continue to add to

the productiveness of the soil. Chemical weed killers, soil conditioners, antibiotics to increase plant and animal growth are just a few of the contributions of this science to agriculture.

(5) Agricultural engineers must find better ways of cultivation, soil conservation and irrigation. New machinery for farms must come forth every year.

The race for food is a race against time. American standards of living depend directly on the productiveness of this nation's soil. If America's agriculture fails to keep pace with the increase of population, our standards must drop. But the promise of science is that this will never happen.

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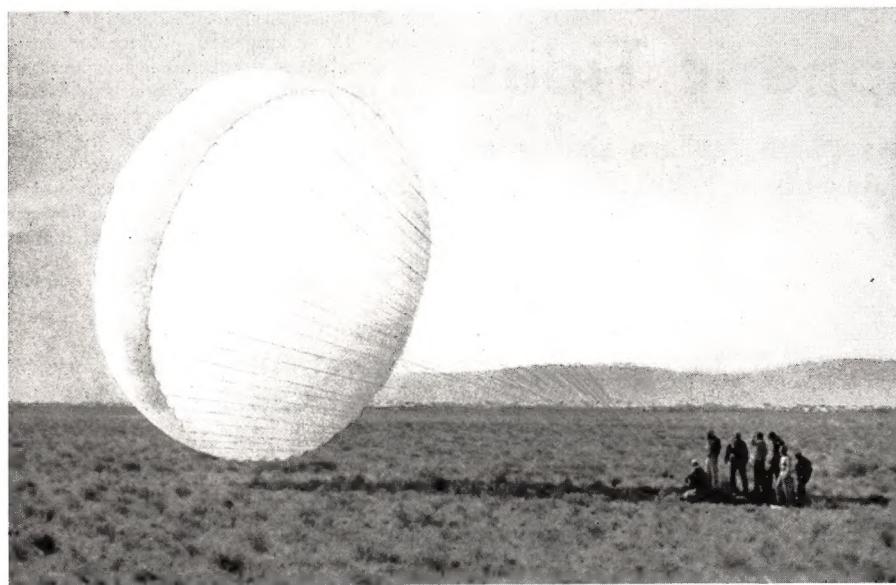
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**PARACHUTE RECOVERY**—Shown here being examined for damage by U. S. Air Force and Ryan Aeronautical Engineers is a comparatively lightweight recovery parachute used for high-speed, heavy-weight drops in the New Mexico desert.

## AERONAUTICS

## Parachute Robot Plane

Robot plane about half the size of a jet fighter can be parachuted back to earth after its use as a military target plane, thus saving wear and tear on the electronic equipment.

► AN AIR Force radio-controlled "fighter" plane, used in military target practice, parachutes to earth when its flight mission is ended, the Air Research and Development Command has reported.

Known as the Ryan Q-2, the robot plane is about half the size of a jet fighter and flies at regular fighter plane speeds. It is controlled remotely from a box on the ground at the Holloman Air Development Center, Alamogordo, N. Mex., and acts as a target for the guns of fighter planes and anti-aircraft artillerymen.

Because of its delicate and expensive electronic stuffings, it is desirable to use a parachute to bring the plane to earth. The parachute can land the plane with less risk to the electronic equipment than can the remote-control system.

No bullets are fired at the plane during target practice. Instead, the plane gives airborne and ground-based radar something to lock on and to track as it maneuvers at near-sonic speeds through the skies.

Especially lightweight for its size, the parachute is unhitched automatically when the plane touches the ground. It has been successfully used in the past to lower some of the heaviest objects ever dropped from aircraft. Some of the objects, such as big guns, plummet through the air at near-sonic speeds, yet are undamaged by the fall.

Although they are a novelty, parachuting airplanes are not new. As early as 1927, aeronautical engineers attached parachutes to planes and proved that the craft could be lowered safely by 'chute in emergencies. It was thought in the 1930's that all commercial aircraft eventually would be equipped with them.

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## PUBLIC HEALTH

## Cosmetics Dangerous To Inquisitive Children

► KEEP THE cosmetic bottles, metal polishes, paint removers and insect repellents securely closed and out of reach of the children, warns Dr. Morton J. Rodman of Rutgers University College of Pharmacy, New Brunswick, N. J.

These substances may contain chemicals that can poison a small child if he drinks them. Since in many cases the ingredients are not listed on the label, the doctor called to treat a child who has taken a swallow or two out of curiosity does not know what antidote to give.

Dr. Rodman predicts that 600 children will die of poison in America during the next 12 months.

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## DENTISTRY

## Women Keep Teeth Better Than Men

► BECAUSE WOMEN visit their dentists more often than men, they lose fewer teeth, the American Dental Association announced in Chicago.

One out of each 10 grown men has lost all his teeth but for grown women the figure is one out of each 15, an association survey shows.

Perfect dental health was found in about one out of 12 of the patients examined.

The survey was made by more than 4,000 family dentists and covered 39,679 patients. Other facts from the survey, appearing in the *Journal of the American Dental Association* (Feb.), are:

Tooth decay was found to be the principal reason for the loss of teeth up to the age of 39 for women and 34 for men. After these ages, periodontal diseases (ailments of the gums and other tooth-supporting tissues) were primarily responsible for loss of teeth. Almost 50% more men than women were found to be in need of extractions because of diseased gums, further indicating more dental neglect by males.

Teen-agers between the ages of 15 and 19 were most in need of dental fillings. Dental patients in this age group were found to have an average of five decayed teeth each.

About one-fourth of all boys and girls between the ages of 10 and 14 were in need of orthodontic (realignment of teeth) treatment.

One out of each ten adult dental patients needed immediate treatment for diseases of the gums.

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## AERONAUTICS

## Eight Jet Engines Power Air Force's New Bomber

### See Front Cover

► THE STRANGE-LOOKING airplane on the cover of this week's SCIENCE NEWS LETTER is the U. S. Air Force's super-secret bomber, the XB-52. The big plane is powered by eight Pratt and Whitney J-57 turbojet engines, believed the most powerful in the world. The engines are slung in double pods under the plane's swept-back wings.

Ordered into production in March, 1951, the plane is 153 feet long and has a wing-span of 185 feet. The curious wing shape shown on the cover is due to three things: the angle at which the photograph was taken, the atmosphere, and the normal upward flexing of the wing tip at the moment the picture was snapped.

Although the Air Force says little about its new plane, onlookers at Boeing Field, Seattle, reported the big ship cracked seven-inch-thick concrete runways there during ground tests. Its engines made so much noise that nearby buildings shook.

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## GEOPHYSICS

# Strong Atmospheric Tides

**Moon causes strong tides in atmosphere similar to those in ocean. Energy equivalent of about 1,000,000 atomic bombs is stored in these tides, physicist reports.**

► THE ENERGY equivalent of about one million atomic bombs is stored in the atmospheric tides caused by the attraction of the moon on the earth's outer envelope.

These lunar tides in the atmosphere are similar to those in the oceans, A. G. McNish of the National Bureau of Standards told the Philosophical Society of Washington in his presidential address. They are found both high in the atmosphere and close to the earth's surface, he reported, and are at their strongest at the equator.

At the earth's surface, the speed of these tides, known as lunar winds, is only about one-twentieth of a mile per hour, too low to be felt or measured. They can, however, Mr. McNish stated, be detected by statistical treatment of a lengthy series of meteorological data.

A study of the lunar winds, both in the upper and lower atmosphere, is leading to a better understanding of the variations in the earth's magnetism.

High tide and low tide in the air come twice daily, just as in the oceans. There are also, Mr. McNish said, high points in the atmospheric tide that are equivalent to the ocean's spring tide. These extra strong changes in the earth's lunar winds come twice in every lunar month, four days after the new moon and four days after the full moon.

From the presence of the low speed lunar winds near the earth's surface, the presence of "greatly amplified" upper atmosphere winds is inferred theoretically. Their effect can be spotted, Mr. McNish said, by charting the changes required in the wavelengths used for good reception of long distance radio under similar conditions in regions near the equator. The frequency necessary to get through clearly may vary as much as 30% in one week between the same two points, he stated.

These radio waves are reflected by ionized layers in the earth's outer envelope, and one layer, known as the F-2, has been known to rise as much as 20 miles an hour.

Often "conspicuous in a day's record," these vertical motions are associated with the moon. By a complex interaction of forces, the vertical movement is connected with the horizontal motions of the ionized layers, which run to similar velocities of about 20 miles an hour. The energy which causes this motion, Mr. McNish stated, is "pumped out" of the lower atmosphere.

The lunar winds rotate around the clock, in the Northern Hemisphere, in a clockwise direction if one could look down on the atmosphere from above. They go to the east in the morning and to the west in the evening, he said.

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## SEISMOLOGY

# New Vertical Seismograph

► A NEW seismograph that can follow earthquake waves eight times around the earth may settle once for all whether this planet's core is molten or solid.

Developed at Columbia University's Lamont Geological Observatory, the "Ultra-long Period Vertical Seismograph" received its first major test by recording the Kamchatka quake of Nov. 4, 1952. This earthquake, which was as powerful as the one that destroyed San Francisco in 1906, was first recorded on the seismograph 12 minutes after the first shock, 5,260 miles away.

Dr. Maurice Ewing, who designed the seismograph with Dr. Frank Press, described the earthquake as seen on the seismograph:

"For the next 20 hours our seismograph recorded the shock waves as they continued to circle the earth in both directions. We detected 15 trains of waves in all. This last group of waves had gone completely around the globe no less than eight times,

having traveled altogether about 182,000 miles. Its wavelength was over 1,000 miles and its period between 400 and 500 seconds, or about seven minutes.

"This particular wave was traveling at a speed of 2½ miles per second, and we believe it felt the earth's core."

The seismograph is designed to measure special shock waves of very long lengths that are governed by the mantle of the earth, instead of by the crust of the earth as in the case of shorter waves.

These waves, called mantle Rayleigh waves, can be used to measure the degree of solidity of the earth's core, Dr. Ewing said, and thus may finally decide the question of whether liquids or solids fill the center of the globe.

First indications from the new seismograph indicate that the earth's core is molten.

"The great interest of the longer waves is that their velocity ceases to increase with

wavelength, contrary to the trend in shorter waves," Dr. Ewing said. "Since the depth of penetration of the surface waves increases with wavelength, we interpret this failure of the longest waves to increase in velocity to mean that they are 'feeling' the liquid core of the earth. If the center of the earth were solid, we would expect a continued increase in velocity with wavelength as the transmitting medium became more dense."

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## HERPETOLOGY

## 17-Foot Anaconda Oldest Captive Snake

► A SOUTH American anaconda holds the longevity record for snakes kept in captivity in the United States. The giant water snake, kept in the Washington zoo, was 17 feet long when he died at the age of 28 years.

Runner-up in the reptilian old-age contest is a rainbow boa, still alive in the Staten Island zoo, 27 years and 4 months old, reports Dr. C. B. Perkins of the Zoological Society of San Diego in a list of 60 longevity records for snakes.

Other records:

A cobra, in the San Diego zoo, 23 years and 3 months; an American corn snake, 21 years and 9 months, Philadelphia zoo; and a reticulated python, 20 years even, at the St. Louis zoo.

The oldest rattlesnake is a Texas rattler, 15 years and 7 months, in the St. Louis zoo.

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## AERONAUTICS

## Turbocompound Engine To Outfly British Jets

► THE SUPER Constellation transport now on Lockheed's assembly line "is the plane the jet has got to beat," company officials have declared in what is believed to be a challenge to Britain's jetliner.

The Super Constellation can cruise 350 miles an hour, powered by four turbo-compound engines that create 13,000 horsepower. Its "unusually long range, coupled with extra speed of the turbo-compound, enables them to outfly jets by avoiding refueling stops," the company said. The new plane can carry 99 passengers.

Britain's much-talked-about Comet jetliner now cruises 350 miles an hour and carries 36 passengers. Powered by four de Havilland engines, the plane has a 1,500-mile range.

The de Havilland Aircraft Company is now under contract to Pan American World Airways to build three modified Comets for delivery in 1956. The Comet III, as it is called, is to cruise 500 miles an hour, powered by four turbojet engines. Each plane is to carry 58 first-class passengers or 76 tourists, and is to have a cruising range of 2,700 miles.

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**CONTRAST CANCEROUS LIVERS**—Laboratory photographs show the startling contrast between enlarged, cancerous rat livers and the normal rat livers from two groups, both fed the same cancer-inducing chemical. The pituitary gland had been removed from the group of rats whose livers were found to be normal.

PUBLIC HEALTH

## Research Hospital to Open

► THE CLINICAL Center, new 500-bed combined research hospital and laboratory of the U. S. Public Health Service's, National Institutes of Health, Bethesda, Md., is scheduled to open "sometime in April," SCIENCE SERVICE has learned.

The exact date has not been announced and probably will not be. The first patients will be received quietly, without even the screaming siren of an ambulance to herald their arrival.

Sparing the feelings of the patients and their relatives is the reason for the comparative hush-hush over the first arrivals.

This new hospital, it is explained, is a research center for study of the major health problems of the nation. Mental and nervous diseases, stubborn infectious diseases, cancer, heart and blood vessel diseases, and arthritis are the chief of these problems. Many patients, however, would not want the relatives or the neighbors back home to know they had come to this hospital if it would immediately label them as having one of these diseases. And even today many patients do not want it known that they have cancer or a mental disease or a serious form of heart disease.

The patients who do come to this hospital, in April or later, will be admitted after lengthy and careful negotiations with their doctors back home to make sure they have the particular type or stage of disease under study, and that they are of the age, sex and other characteristics that fit the particular study.

No patient will be admitted except when referred by a cooperating physician or

medical group, such as the staff of a teaching hospital.

This hospital is not just another hospital to care for patients. While the actual care will be the best that can be given, the hospital's prime objective is to help find ways to conquer diseases that afflict not only its 500 patients but hundreds of thousands or even millions of Americans all over the nation.

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INVENTION

### Patent Heating Unit For Wounded Soldiers

► A HEATING unit which may be slipped into casualty evacuation bags to keep wounded soldiers warm on their trip from the front to the aid station or hospital has been invented.

Insulated with Fiberglas, the unit is so arranged that one flat side is porous and the other is non-porous. An inner layer of Fiberglas holds a catalyst such as carbon black which is distributed among the fibers. In the middle of the unit is a fuel reservoir which feeds fuel to the Fiberglas.

The heating unit, the inventors claim, can keep a wounded man warm without danger of too much heat. Donald M. Stadd, New York, and Raymond P. Schreiber, Washington, received patent 2,627,266. They specify that the government may be allowed to use their invention without making royalty payments.

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BIOCHEMISTRY

## Clue to Cancer Seen In Pituitary Gland

► THE PITUITARY gland in the head is now under suspicion as playing a villain's role in the development of cancer.

The suspicion comes from rat experiments at Stanford University, California. In the experiments, rats that had their pituitary glands removed failed to get cancer when fed a cancer-producing azo dye. Other rats, with pituitary glands left in their heads, developed large cancerous growths in their livers after 14 to 19 weeks of the diet.

The pituitary gland, at the base of the brain, influences other glands of the body, including the adrenal glands. Next step in the research is to learn which function or gland influence of the pituitary is involved in the cancer picture.

The research so far has been carried out by Prof. A. Clark Griffin, Drs. A. P. Rinfret and Charles Robertson, Mrs. Marjorie O'Neal and V. F. Corsiglia. Results are reported in *Cancer Research*.

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METEOROLOGY

### Little Drops Bump Bigger Water Drops

► LITTLE DROPS of water bumping into bigger drops of water may be the most important factor in producing rain. This was a theory tossed out to weathermen at the meeting of the American Meteorological Society in New York by Wendell A. Mordy and Laurence E. Eber of the Pineapple Research Institute in Hawaii.

Several years ago, most weathermen thought that most rain came from clouds which reached high enough altitudes to be cold enough to produce tiny ice crystals. The ice crystals, this theory went, became large enough to fall through the clouds, melting when they got low enough and thus hitting the face of the earth as rain.

Weathermen knew that some rain was coming from warm clouds, clouds that did not reach freezing and sub-freezing heights, but they thought this was only a minor factor in the production of rain.

Mr. Mordy and Mr. Eber presented a record of 10 typical days of trade-wind weather in Hawaii. On six of those 10 days it rained, and in no case did rain come from any cloud colder than 7.2 degrees Centigrade, about 45 degrees Fahrenheit.

Although they merely presented these observations, other weathermen picked up the implication that warm cloud rain may be more important and of greater volume than cold cloud rain in most other parts of the earth. If that is so, rain drops large enough to reach the ground without evaporating are probably formed by coalescence—by little drops of water in the clouds bumping into slightly bigger ones until large enough drops are formed to reach the earth.

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## MEDICINE

## Danger of Frostbite For Elderly Persons

► A WARNING on the danger of frostbite, especially to older persons who continue at outdoor work, has been given by Dr. Gerald H. Pratt of New York City. Such persons are "dangerously susceptible to cold," he points out in a report to *GP*, the journal of the American Academy of General Practice.

Men whose work requires them to go in and out of refrigerator cars or iceboxes are in danger of suffering exposure, Dr. Pratt says. A variety of conditions made a person vulnerable to freezing cold. The presence or lack of wind, the humidity, the person's clothing, his age, and his general condition, all play a part in the degree of frostbite.

Dr. Pratt warns, "Most often the first symptom is a painful burning sensation followed by numbness and cold." Napoleon's chief surgeon described the sensation, "as if the feet are made of wood."

The prevention of frostbite in civilian life is a big job, Dr. Pratt feels. An elderly person, or one who has diabetes or some circulatory disturbance should not be exposed or permitted to work out of doors in cold or wet weather. Shoes and socks should be changed as often as possible after exposure to wet or cold.

Exposed people must be kept moving and not allowed to fall asleep in the cold. Seeing that the body is clean before going out in the cold or wet is important too, since infection will occur and tissue loss will increase if the skin is unclean and the skin broken because of frostbite.

Proper treatment of frostbite is very important he points out. Wounds should be cleansed, if they are dirty, with great care to prevent any tissue injury.

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## INVENTION

## Patent Issued TV System For Transoceanic Service

► A FLYING chain of commercial airliners, cargo planes and other aircraft may be used in the future to get television from continent to continent. In a system patented this week, the planes would relay the line-of-sight signals over oceans that the signals cannot span by themselves.

Invented by Clarence W. Hansell of Port Jefferson, N.Y., and Donald S. Bond of Princeton, N.J., the system is based upon a transoceanic aircraft schedule that would keep planes flying 24 hours a day over the seas. Each plane would trail its predecessor by 250 or 300 miles, and all would fly about 10,000 or 15,000 feet high.

Television signals leaving England for America would be transmitted first from a land-based station, presumably in London. The program would be picked up by the plane nearest England and would be relayed automatically to the next plane in the

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series flying toward America. Through such an airborne chain of relay stations, the program would skip across the Atlantic at the speed of light. It would be picked up by a TV station in New York and telecast to America the regular way.

The patent also provides for a similar set of flying relay stations to carry a television program from America to England at the same time.

Through electronic directional devices, the television signals can be pointed directly at the plane ahead so that good reception is assured. Called a "service channel," these devices also permit verbal communication between planes.

The inventors assigned their patent, number 2,627,021, to the Radio Corporation of America.

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## BIOCHEMISTRY

## Synthetic Hormone Helps Breast Cancer Victims

► EIGHTEEN WOMEN with advanced inoperable breast cancer have been helped by a new hormone drug, Dr. George C. Escher of Memorial Hospital and Sloan Kettering Institute, New York, reported at the meeting of the southern section of the American Federation for Clinical Research in New Orleans.

The drug is a synthetic hormone called androstanolone. It is a male hormone type of chemical but has weak masculinizing effects. For this reason it seems preferable to testosterone, male hormone used for some years in treatment of inoperable breast cancer.

Although only 43% of the 42 patients treated showed objective improvement, a larger proportion showed improvement in symptoms such as pain, lack of appetite and generally unwell feeling. This symptomatic improvement occurred in 31 of the 36 out of the 42 treated who had symptoms. In 19 of the 31, however, the symptomatic improvement came without objective improvement, or signs of the drug affecting the cancerous condition itself.

Androstanolone was originally prepared by two European chemists and Nobel Prize winners, the German, Dr. A. Butenandt, and the Swiss, Dr. L. Ruzicka. Because of its weak male hormone action, it was not given much attention, but Prof. A. Lipschutz of the Santiago laboratories of the Chilean Public Health Service found it had anti-tumor effects in laboratory animals. Dr. Escher and associates tried it in a screening of various hormones that might be more effective than testosterone.

The drug is now being made under the name, Neodrol, by Foundation Laboratories of New York, an associate of the Syntex laboratories in Mexico.

Working with Dr. Escher in its trials were Drs. Joseph H. Farrow, Dorothy W. Sved, Guy Robbins, Helen Q. Woodard and Norman E. Treves.

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## AERONAUTICS

## Rotating Beacons For Airliners' Tails

► ROTATING BEACONS that finger the night from hilltops soon will have mechanical brothers flying in the sky.

At least two commercial airlines are equipping their fleets with new 50,000 candlepower rotating tail lights. The lights should reduce chances of two-plane collisions at night and in conditions of poor visibility. Other airlines are expected to follow suit.

The light is mounted on top of the vertical fin of the airliner's tail. It rotates slowly, warning nearby planes of the airliner's presence.

Developed by General Electric Company engineers in Cleveland, the lights are of the sealed-beam variety. They are about 50% brighter than automobile headlights.

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## TECHNOLOGY

## Way to Pack Lemons Saves \$9,000,000 Yearly

► THE PUBLIC should enjoy a \$9,000,000 saving in its annual lemon bill if a packing technique developed at the University of California at Los Angeles is adopted.

Dr. Roy J. Smith, associate professor of agricultural economics, who developed the new technique, estimates the new method will save lemon packing houses about 72 cents a standard box, since it cuts down packing costs as much as 80%, and retailers about 35 cents a box because of easier handling. Such a saving would exceed \$1 a box on the estimated 9,000,000 boxes of lemons shipped from California each year.

In contrast to the conventional method of packing lemons, in which each lemon is sized, wrapped in paper and placed in wooden crates by hand, the new process allows the lemons to be literally "poured" unwrapped into chemically-treated cardboard cartons which are half the size of old-type wooden crates. Before the carton is sealed by a special machine, the fruit is shaken into a solid full pack by placing the box on an electric vibrator.

"The key to packing lemons in bulk," said Dr. Smith, "was the development by a Florida company of a fungistatic material with which the inside of the carton is laminated. This material stabilizes fungi growth and sets up a vapor pressure which prevents spoiled fruit from contaminating others."

Dr. Smith worked with the Citrus Industry Research Association and several commercial firms.

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# SCIENCE FIELDS

## PSYCHOLOGY

## New View of Neurotics: They Want to Be Thus

► A NEW viewpoint on neurotics, which will appeal to many of their friends and relatives if not to the neurotics themselves, has been developed by Prof. O. Hobart Mowrer, University of Illinois psychologist.

If a person is neurotic, Prof. Mowrer thinks, it is because he wants to be that way. In a report at the Cooper Union Forum in New York he said that neurosis is not an illness but a way of behaving, and it is just as much the choice of the individual as any other form of conduct.

Prof. Mowrer believes that neurosis is caused by "one's own denied sense of shame and self-criticism." His position differs from Freud's in that it places more responsibility upon the individual than upon parents or society for the cause of neurosis.

"This conception of neurosis, I am sure, has far less appeal to neurotics and other immature persons than does the strictly Freudian conception," he said. "And it is, rather obviously, related to the traditional religious view in such matters, which is epitomized by the familiar adage: Be good and you will be happy, that is, normal, non-neurotic.

"The neurotic, far from having too much guilt, as the Freudian position implies, has too little—too little in the sense of not letting it enter consciousness and participate in the control of his decisions and actions.

"Irresponsibility is perhaps the neurotic's greatest offense; and one of the main objectives of therapy should be to get the patient, little by little, to reverse this trend and become increasingly willing to be responsible, to take rather than evade consequences, and in this way to be changed by reality instead of trying to live on in a false world of one's own creation."

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## ICHTHYOLOGY

## Electricity Captures Eels for Life Studies

► SCIENTISTS ARE using electricity to capture elusive, although non-electric, eels for studies on their life history.

A. M. R. Burnet of the Fisheries Research Laboratory, Wellington, N. Z., reported in the *Australian Journal of Marine and Freshwater Research* (Oct., 1952) that he has successfully used electro-fishing techniques for population studies of the eels of New Zealand.

Mr. Burnet sets up a rapidly pulsating electric field in the water between two electrodes which are attached to the ends of

long wooden poles. Power is supplied from four 6-volt batteries and carried by highly insulated wires. Eels caught in this electric field are stunned or they are chased downstream into a waiting net.

For his population studies, Mr. Burnet selected representative areas about 100 yards in length in the Horokiwi, Wainui-o-mata and Mangaroa rivers, placing a fine-meshed net across the river downstream. Then starting upstream, Mr. Burnet and an assistant, both insulated by rubber boots and electric linesman's rubber gloves, moved down, covering the entire bottom with the electric field. Mr. Burnet estimated that 81% of the eel population in the test area was captured when the bottom was scoured with electricity three times, the usual practice.

This technique of electro-fishing, which marks an improvement over earlier attempts, may prove of great value in the study of fishes.

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## PUBLIC SAFETY

## Torch Fabrics Banned By Commercial Standard

► FEWER INSTANCES of clothing going up in flames are expected to result from the recent adoption of a "commercial standard for flammability of clothing textiles."

Elimination of highly combustible, or "explosive," fabrics from the retail market is the standard's aim. Although only a few, fly-by-night-type manufacturers of clothing fabrics put out the highly flammable materials, tragic accidents result.

Still needed is a federal law under which anyone violating the ban against flammable garments in interstate commerce could be prosecuted. Such a law, introduced by Rep. Gordon Canfield (R., N. J.), is now pending before the House Commerce Committee. His bill incorporates the standards adopted by the industry.

Congressman Canfield has introduced similar bills since the 80th Congress, but they have never got out of committee. The adoption of the standard by industries concerned may speed passage of such a bill, since it sets a nationally recognized method for distinguishing between safe and unsafe clothing textiles.

Work on the test method was spurred by last year's "torch" sweater tragedies. Several years ago a number of fatalities resulted from the extremely flammable nature of long-napped chaps on children's cowboy suits.

The new standard is aimed at providing the public with the maximum protection from such dangerous fabrics. Representatives of cotton and rayon producers, fabric manufacturers, finishers, converters, wholesalers, retailers and consumers helped to develop the standard under the coordination of the American Association of Textile Chemists and Colorists and the National Retail Dry Goods Association.

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## PUBLIC HEALTH

## Handicapped Concern Of New Administrator

► HELPING MEN and women who are crippled or otherwise handicapped to get back on their feet so they can work and be independent will be a special aim of the new Federal Security Administrator, Mrs. Oveta Culp Hobby. This will be so if one can judge from her first public speech since her appointment, made to the Women's National Press Club in Washington.

Evidence of her interest in this work, carried on by the Office of Vocational Rehabilitation in her agency, is seen in the fact that the work of this office and that of only one other, the Social Security Administration, were chosen for specific examples of the FSA's work. Of course, this may have been because Mrs. Hobby has not yet had time to familiarize herself with the work of the other eight agencies in the FSA.

As an "outstanding example of money wisely and productively spent," Mrs. Hobby told of a man crippled in an accident, who for more than a year had been getting \$182 a month relief money for himself, his wife and five children. At an outlay of \$261 of Federal Vocational Rehabilitation funds for surgical and hospital care, this man was "literally put back on his feet" so that he could get work paying him \$87 a week.

In the past year, Mrs. Hobby said, 12,000 people who had been on relief at a cost of \$8,500,000 were rehabilitated at a cost of \$6,000,000. After rehabilitation, these people are able to earn at the rate of \$22,000,000 a year.

Mrs. Hobby feels that she and the 34,800 or so employees of FSA must consider themselves "a peculiarly dedicated group of people" because their work has such great impact on the lives of all Americans.

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## INVENTION

## 3-Dimensional Movies Without Optical Devices

► THE CURRENT boom in three-dimensional movies may profit by an invention of Ralph L. Huber of Seattle, Wash. Mr. Huber's invention promises the illusion of three dimensions without requiring the viewer to wear special optical devices like the glasses handed out in some movie theaters. The inventor also claims that any number of positive prints can be made from the negatives used in his system, and the prints can be distributed through regular channels.

In his system, the "right-eye" and "left-eye" views are projected on a special screen. The screen is built so that each view will be reflected, respectively, into the proper eye of each member of the audience, no matter where he is sitting.

Mr. Huber received patent number 2,627,200 for his invention.

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# You Take Time To React

**Your auto moves forward several dozen feet while you try to stop in an emergency. It continues going forward even while you move to step on the brakes.**

By MARTHA G. MORROW

► THERE IS a danger zone in front of every moving automobile. It is the distance you travel between the time you spot danger and the instant your car actually stops.

As your reaction time becomes greater from fatigue, worry or eyestrain, the danger zone lengthens. As the speed at which you drive your car increases, the farther this zone of danger stretches out in front of you. Fog and snow, poor brakes and bad roads make it still longer.

This distance within which you cannot stop is surprisingly long. With average brakes, if you are traveling at only 20 miles an hour, you probably move over 50 feet even after you have spotted danger. If moving 40 miles an hour, you go about 165 feet before stopping. And if speeding along at 60 miles an hour, you will go forward over 335 feet before coming to a standstill.

When a driver sees a car about to cross his path or a child dart out into the street, he must react quickly to avoid an accident. It takes time for you to realize the danger and move to avoid it; time passes while you step on the brakes which slowly bring the car to a halt.

## Time Lag Before Action

Three-quarters of a second usually passes, with the car at unchecked speed, between the time a driver spots danger and steps on the brake pedal. A car being driven ten miles an hour normally goes forward a minimum of 11 feet between the time a driver becomes aware of danger and steps on the brakes. One going 20 miles an hour usually moves forward 22 feet. A car driven 60 miles an hour goes 66 feet forward before the driver, spotting danger, reacts to put on the brakes.

You probably think you move rather quickly when alerted for danger—which is not always the case when you drive. The truth, however, may be otherwise. A simple little gadget which you can easily make at home shows how really slow you and your friends are in your reactions.

Called a gravity chronoscope, the device was designed by Dr. Harold Schlosberg, psychologist at Brown University, Providence, R. I. To measure your time, simply have a friend drop an object and see how far it falls before you can stop it.

The following table shows the time required for an object to fall different distances. The best object to drop is a yard-

stick. It will save trouble if you mark the stick off in time units so the reaction time can be read directly from it. Thus opposite the half-inch mark put .05 sec. Use the following table, copying the numbers so you can read upward from zero.

This table shows how far a free-falling object will drop during the first half second:

Seconds	Inches
Start	0
.05	1/2
.10	1 15/16
.15	4 5/16
.20	7 11/16
.25	12
.30	17 5/16
.35	23 1/2
.40	30 3/4
.45	38 7/8
.50	47 7/8

Use a doorframe so you will have a sort of track to guide the yardstick as it falls.

Mark a short horizontal pencil line at eye level on the frame. This is your index line, the place where your friend should hold the bottom, zero point of the yardstick each time you perform the experiment.

Ask him to press the yardstick against the doorframe with his thumb, standing so you can hold your thumb just below the end of the stick, ready to stop it by pushing it against the wall. Watch the yardstick and try to stop it as soon as you see it move, but do not touch it until it is actually released. The index line will enable you to read your reaction time directly.

Have a competition to see which one of a group has the quickest reaction time. For this, it is fairest to average about ten readings for each as sometimes a person is caught napping on a single trial. Always make a sudden release movement, or your friends will soon learn to beat the game.

In these experiments you were on the lookout for the falling object or finger movement which released the yardstick, and you were set to make a single simple reaction. In driving, however, there are many distractions; it takes longer to size up the situation and make the proper one of several possible responses. You seldom immediately become aware of danger, and



**QUICK-STOPPING TEST**—High school students, under the direction of Pennsylvania State College scientists, measure accurately the reaction time and the stopping distance of a test car through the use of a detonator device. A blank cartridge fires a chalk mark on the street at the start of the test and at the time the brakes are applied, making it possible to measure the danger zone in front of the car.

when you do, your foot reaction is always slower than your hand reaction.

When you expect trouble, it may take you only 0.4 to 0.5 second to step on the brakes. When you are required to steer the car as well, your brake-reaction time increases to around 0.6 to 0.7 second. In actual driving on the road, your performance is even more complex and 1.5 seconds or more usually pass before you react, as shown by studies at the Yale Bureau of Highway traffic by Dr. T. W. Forbes. Failure to recognize potential hazards is an outstanding cause of accidents.

If you are a young and inexperienced driver, pay particular attention to your driving. Drivers under 25 years of age have more than their share of accidents, according to a number of studies of accident records by Dr. A. R. Lauer of Iowa State College and others. As a rule, drivers over 35 and under 60 years of age have fewer accidents. If you are over 60, you do not react as quickly as you used to and must exercise more caution in driving.

Not only does a car continue to go forward, however, while you move to step on the brakes but it takes time for the brake pedal to actuate the brakes, for the brakes to grip the wheels and for the wheels to

stop rolling. The following experiment will give you a rough idea of how far forward even a slow-moving car goes between the time someone shouts "stop" and the instant the car comes to a standstill.

Drive your car on a private driveway where there is no other traffic. If you do not drive, measure someone else's stopping distance. Fill a small bag with sand or dirt, or use a bean bag, so it will stay where dropped. Ask a friend to hold the bag far out of the right window, and shout "stop" at the very instant he throws the bag down vertically.

Drive your car at ten miles an hour, and put on the brakes the instant your friend calls "stop." Measure the distance from the car window back to the bag and you will discover about how far the car went after the stop signal was given. Actually, the car moves a bit farther because the bag of sand, while falling, moved forward with the speed of the car.

A chart makes vivid the great distance covered in stopping after danger has been sighted. Designed by the American Automobile Association for an average reaction time of .75 second and relatively good brakes (50% efficient), the following shows total stopping distances for various speeds:

#### STOPPING DISTANCES

#### IF YOU GO THIS FAST

Miles per hour	Feet per second	Reaction-time distance (feet)	Braking distance (feet)	Total stopping distance (feet)
10	14.7	11.0	7	18.0
15	22.0	16.5	15	31.5
20	29.3	22.0	27	49.0
25	36.7	27.5	42	69.5
30	44.0	33.0	60	93.0
35	51.3	38.5	82	120.5
40	58.7	44.0	107	151.0
45	66.0	49.5	135	184.5
50	73.3	55.0	167	222.0
55	80.7	60.5	202	262.5
60	88.0	66.0	241	307.0

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People usually underestimate the braking distance of a car because they assume that if the speed is doubled, the braking will also be doubled. But braking distance increases as the square of the speed. So actually if you are going along at 20 miles an hour and can stop within 30 feet, then speed up to 40, your braking distance will be four times as great or 120 feet. If your speed is three times as great, or 60 miles an hour, your braking distance will be increased nine times to 270 feet.

Several very exact instruments for measuring actual stopping distances have been developed by the Traffic Engineering and Safety Department of the American Automobile Association. Designed to be suspended from the car, they ride about six inches above the ground. Blank cartridges force a piece of chalk onto the pavement, permanently marking the point where the signal to stop is given, the brakes applied and so on.

### Gadgets for Indoor Use

Other gadgets, designed for indoor use, also give a pretty good indication of your driving ability. Some, using automobile parts, measure how well your eyes, hand and foot coordinate. Others present actual traffic hazards in miniature on a small-scale road and record how well you avoid them by indoor driving.

But even if you react promptly, the "grip" of your tires may not be too effec-

tive on the road surface. Or the weather may be working against you. Skid marks are mute witnesses to the distance a car slides on a wet pavement, mud or snow. Even at only 35 miles per hour a car will skid nearly a hundred feet on wet concrete. So watch your speed, the one factor over which you have greatest control.

### Arrange Own Demonstration

Following the suggestions in this article, you can take the lead in arranging a safety demonstration in your community, perhaps in cooperation with your local newspaper.

A detonator for showing delayed stopping time can probably be borrowed from your local AAA Club, progressive truck fleet company, high school offering driving instruction or police department. Advance practice will help your program go off smoothly.

Select a straight stretch of road that can be blocked off easily by arrangement with and under direction of the local police. For participants in the test, pick a high school boy and girl who have recently learned to drive, several adults of varying temperament, a fleet or other professional driver, and one or two older people. To avoid embarrassment, however, be sure to explain in advance to the older volunteers that the test may show them a little slow in reacting.

Test reactions when alerted and when not primed for the "stop" signal to show how slow drivers often are in becoming aware

of danger. Arrange for those watching the show to test their own stopping distances if they wish. The local fire department will probably be glad to wet the road for skidding demonstrations. Others also would undoubtedly like to cooperate in such a highway safety demonstration.

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### ICHTHYOLOGY

## Large Shark Caught 2,300 Miles From Sea

► A SIX-FOOT shark has been captured 2,300 miles from the ocean, in the Peruvian headwaters of the Amazon river, reports Dr. George S. Myers, ichthyologist of Stanford University, Calif.

Dr. Myers said he learned about the river-going shark from Senor Felipe Ancieta of the Peruvian fish and game department, who sent him a picture of the shark which was caught near Iquitos, 2,300 miles from the Atlantic Ocean. The shark belongs to the genus *Carcharhinus*, the ground sharks, Dr. Myers said.

While sharks are known to travel some distances up rivers, this is the first authentic record of a shark from so deep in the Amazon, Dr. Myers said. Several unverified reports had previously mentioned sharks as far up the river as Manaus, Brazil, 1,000 miles from the coast.

Science News Letter, February 14, 1953

# Now, You Can Stop Saying "I Always Spend Too Much on My Vacation"

No matter what kind of vacation you want this year or next or where you want to go, Norman D. Ford, founder of the world-famous Globe Trotters Club, can tell you *exactly*

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No matter how you want to reach your vacation spot or if you want to spend your entire vacation touring, Norman Ford draws upon his long experience and the advice given him by thousands of travelers, so that you can save, while enjoying yourself more, whether you go by auto, plane, rail, or ship. On auto travel alone, his simple ways to cut costs can save most automobile parties \$6 or \$7 a day.

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

AGREEMENT ON THE IMPORTATION OF EDUCATIONAL, SCIENTIFIC AND CULTURAL MATERIALS: A Guide to Its Operation—UNESCO (*Columbia University Press*), 21 p., paper, 20 cents. A pamphlet intended to acquaint interested individuals and organizations with the UNESCO agreement and to aid them in deriving maximum benefit from it.

ANNUAL REVIEW OF NUCLEAR SCIENCE, Vol. 2—James G. Beckerley, Martin D. Kamen and others—*Annual Reviews*, 429 p., illus., \$6.00. Covering the most important developments in the field for the year that have been cleared with respect to security.

THE ARCTIC WOODLAND CULTURE OF THE KOBUK RIVER—J. L. Giddings, Jr.—*University Museum*, 143 p., illus., paper, \$2.50. Report of a study of the present Eskimo-speaking population of this area which includes clear streams, rugged mountains, forests and a bay of the sea, as well as of the archaeological remains which show more than 700 years of continuity for these people.

ASSURING PUBLIC SAFETY IN CONTINENTAL WEAPONS TESTS: Thirteenth Semiannual Report of the Atomic Energy Commission—Gordon Dean, Chairman—*Govt. Printing Office*, 210 p., illus., paper, 50 cents. In the last six months of 1952, production of fissionable materials was stepped up, construction was started on an atomic reactor for the submarine U.S.S. Nautilus, a contract was entered into for developing a reactor for an aircraft carrier and preparatory work advanced toward atomic airplanes. (See SNL, Feb. 7, p. 85.)

EDUCATION AND LIBERTY: The Role of the Schools in a Modern Democracy—James Bryant Conant—*Harvard University Press*, 168 p., \$3.00. As a text for these lectures, Dr. Conant selected a quotation from Thomas Jefferson: "It is an axiom in my mind that our liberty can never be safe but in the hands of the people themselves, and that, too, of the people with a certain degree of instruction."

ELEMENTS OF MATHEMATICS—Helen Murray Roberts and Doris Skillman Stockton—*Addison-Wesley*, 211 p., paper, \$3.00. Designed as a text for college students who are deficient in secondary school mathematics.

EXPANDING OUR INDUSTRIAL MIGHT: The Build-Up of U. S. Industrial Capacity—Office of Public Information, Defense Production Administration—*Govt. Printing Office*, 30 p., illus., paper, 30 cents. Giving statistics on our expansion program.

FERNS OF HAWAII NATIONAL PARK—Douglas H. Hubbard—*Hawaii Natural History Association*, 40 p., illus., paper, 50 cents direct from publisher, Hawaii National Park, Hawaii. An introduction to the more abundant species of fern which may be seen by the visitor.

FORMOSA: A Problem for United States Foreign Policy—Joseph W. Ballantine—*Brookings Institution*, 218 p., illus., \$2.75. Providing the reader with that background which will enable him to understand and evaluate U. S. policy toward Nationalist China.

AN INTRODUCTION TO MATHEMATICAL THOUGHT—E. R. Stabler—*Addison-Wesley*, 268 p., \$4.50. Intended to present material for the study of the role of thought in mathematics and the role of mathematics in thought.

MAMMALS OF YOSEMITE NATIONAL PARK—Harry C. Parker—*Yosemite Natural History Association*, 53 p., illus., paper, 60 cents direct from publisher, Box 545, Yosemite National Park, Calif. Intended to introduce the visitor to the park to the 78 kinds of wild animals he is likely to see there.

A MODIFIED METHOD FOR THE ESTIMATION OF CORROSION DUE TO THE FREE SULFUR AND SULFUR COMPOUNDS IN OILS—Richard A. Patton and Joseph H. Lieblich—*Mellon Institute*, 8 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

ON THE MOLLUSK FAUNA OF THE LANDLOCKED WATERS OF BERMUDA—Fritz Haas—5 p., paper, 10 cents. The reclaiming of marshes for agricultural purposes is putting an end to such marine fauna.

REPORT OF THE CHIEF OF THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE 1952—Avery S. Hoyt, Chief—*Govt. Printing Office*, 84 p., paper, 25 cents. Major accomplishments of the year included the practical control by an insect predator of the noxious Klamath weed in one California county, and the successful colonization in Mexico of parasites to control citrus blackflies.

SOME PLANT-SOIL-WATER RELATIONS IN WATERSHED MANAGEMENT—Leon Lassen, Howard W. Lull and Bernard Frank—*Govt. Printing Office*, USDA Circular No. 910, 64 p., illus., paper, 20 cents. Although resulting generally from forest and range research, the findings here reported also apply to farm land.

Science News Letter, February 14, 1953



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## METEOROLOGY

# Change Hawaiian Climate

► ONE HUNDRED tons—200,000 pounds—of common table salt is being tossed into clouds over Hawaii in a three-month period in an effort to make rain.

This is a result of Nobel Prize-winner Dr. Irving Langmuir's suggestion that the climate of tropical islands such as Hawaii and Puerto Rico can be considerably changed by tossing ground-up table salt into clouds which might not otherwise produce rain.

No one directly connected with the experiment will talk about it to reporters, but SCIENCE SERVICE learned about these vast amounts of salt being thrown at clouds from authoritative sources. Reason for reluctance to talk is the controversial nature of Dr. Langmuir's theory as to the effects of throwing salt at clouds. Many scientists do not believe that such large scale effects can be obtained.

The effort is being supported by one cattle ranch. The machinery for throwing it into the clouds is on the top of a 4,000-foot mountain situated on the ranch.

The salt, bought from a company which makes the table salt usually sold in retail grocery stores for about 15 cents for two pounds, is ground up into quite tiny salt crystals. The effort is made to duplicate the crystals tossed up from the surface of

the ocean around which most rain is believed to be formed.

The experiment will be over at the end of this month.

Only after several months of arduous pouring over statistics will those in charge be able to know whether or not the salt actually produced any change in the rate of rainfall over the ranch in question. This will also be true of more large-scale effects some scientists expect to be produced.

The salt is not tossed into the sky every day. A strictly objective method of picking out random days in the three-month period was used. Only on those random days is the attempt made to make rain with salt. It is the theory that these days can be compared with similar days in past years to show whether or not an increase in rainfall was achieved.

Science News Letter, February 14, 1953

## MEDICINE

# Diphtheria Immunization

► OLDSTERS, WHO in recent years have become the primary target of diphtheria, can now be immunized against the disease without the usual painful local and general body reactions.

This is reported by a group of doctors of the University of California School of Medicine, San Francisco, who have successfully tried a new technique of immunization in 163 persons, most of them elderly.

Thirty years ago diphtheria was a disease primarily of childhood, the great majority of cases occurring in the first few years of life. Since then, however, immunization programs have made diphtheria uncommon in childhood.

As a result of decreased incidence of the disease, the California doctors point out, there is less chance to acquire or maintain natural immunity by exposure to the diphtheria agent.

Older persons thus have become the prime target of diphtheria, and complications and mortality are at a maximum among the elderly. In San Francisco at present, about 60% of diphtheria cases are over 30 years of age.

Large scale immunization of adults to diphtheria by the methods used for children has never been feasible because of the high incidence of severe local or general reactions to the immunizing material. The dose for children is usually three monthly injections of one cubic centimeter each, under the skin.

The California physicians used three very small doses at monthly intervals—1 cubic centimeter per dose. The doses were injected into, not under, the skin.

Blood tests showed that all but seven patients were successfully immunized. There

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# Questions

AGRICULTURE—How many tons of land products are required each year for each person in the U. S.? p. 100.

• • •

DENTISTRY—Why do women lose fewer teeth than men? p. 101.

• • •

GEOPHYSICS—What is the energy equivalent stored in the lunar atmospheric tides? p. 102.

• • •

PUBLIC HEALTH—How are cosmetics dangerous to inquisitive children? p. 101.

• • •

PUBLIC SAFETY—How long is the danger zone in front of an automobile moving 40 miles an hour? p. 106.

• • •

Photographs: Cover, U. S. Air Force; p. 99, U. S. Marine Corps; p. 101, Ryan Aeronautical Co.; p. 103, Stanford University; p. 106, Pennsylvania State College; p. 112, Saxon Instrument Co.

were no severe reactions, and only six minor reactions.

The California research team consisted of Drs. Henry D. Brainerd, William Kiyasu, Mirra Scaparone, and Louis O'Gara. Their report was made in the *New England Journal of Medicine* (Nov., 1952).

Science News Letter, February 14, 1953

## PHYSICS

## A-Power No Help For Space Travel

► ATOMIC ENERGY will not help in powering space rockets, Dr. Fritz Haber of the U. S. Air Force School of Aviation Medicine, Randolph Field, told the Institute of Radio Engineers meeting in San Antonio, Tex. The atomic power source would be as heavy and bulky as chemical fuels conventionally used.

Science News Letter, February 14, 1953

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## PHYSIOLOGY

# Prevent Ingrown Toenail

DO NOT blame badly fitting shoes or stockings or faulty foot balance for ingrown toenails. Such conditions can cause plenty of trouble and should be corrected, but the ingrown toenail has another cause, in the opinion of Dr. David I. Schwartz, chief of the orthopedic section of the Veterans Administration Hospital, New York.

In the average case, ingrown toenails result from infection brought on by improper trimming of the nails, in Dr. Schwartz' opinion. At a meeting of the American Academy of Orthopaedic Surgeons in Chicago, he said:

"It has been my custom for many years to tell my patients that it should take no longer than one minute to trim the toenails on one foot and if it takes longer than that they are probably doing it improperly. The nail should be trimmed across the distal (outer) end so as not to injure the skin. The sharp corners on each end of the distal most portion of the nail can then be rounded off with scissors or emery board, but under no circumstances should the nail be trimmed into the tissue."

He said that the usual procedure for the average toenail victim is to dig deeply and the more deeply he digs and cuts the more thoroughly he thinks he is doing the job. This is the wrong procedure. In many cases, the skin is broken and infection follows.

"It is surprising to find," Dr. Schwartz said, "that many work days are actually

lost and much pain and disability is experienced by those suffering from ingrown toenails."

"The growth of the nail," he explained, "is continuous during the life of the individual, being more active in the young and during the summer season. From 100 to 160 days are required for the reproduction of a finger nail and three times that period for a nail of the toe. That means that it takes a minimum of nine months to regrow a toenail."

Science News Letter, February 14, 1953

## Do You Know?

*Musicians in Aztec society were exempt from taxation, but mistakes in performance of ritual music, such as a missed drum beat, brought the death penalty.*

*One out of every 13 chemists in industry today is a woman.*

*About 20,000,000 pounds of clams are harvested yearly on the Atlantic coast.*

*Beavers weighing nearly 80 pounds have been trapped in Missouri.*

*The entire collections at the Smithsonian Institution's National Museum are estimated to be worth over a billion dollars.*

## The Knack of Using Your Subconscious Mind

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TEACHING AID for physics instructors explains the present scientific theory of magnetism from the make-up of a "magnetic atom" of iron to the finished bar or horseshoe magnet. The chart is illustrated with seven drawings, each accompanied by brief text.

Science News Letter, February 14, 1953

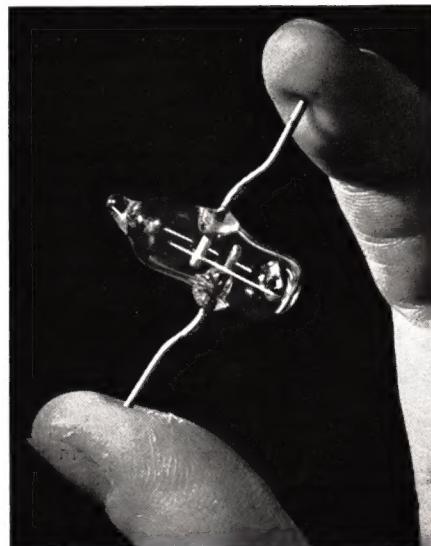
FIRE ALARM bell for the home clangs loudly in the master bedroom when a fire breaks out in the house. Individual rooms are monitored by detector cells, set for 125 degrees Fahrenheit, which sound the alarm when overheated. The system can be obtained to work on batteries or on standard electric current.

Science News Letter, February 14, 1953

FORM-FITTING MASK of aluminum is held over the nose and mouth by an elastic headband, weighs less than one-half an ounce and is comfortable to wear. It filters particles of cement, lime, gypsum metal and dust from air inhaled by the wearer. Not recommended where fine silica dust, lead, arsenic and other toxic dusts are present.

Science News Letter, February 14, 1953

ROTATING MERCURY switch is a lightweight glass tube-like affair designed to work at very low temperatures, as shown in the photograph. It shoots a pulse of electricity up to 1,000 watts through a circuit for a split-second while a globule of mer-



cury rolls past the current-carrying wires inside. Good for airplane beacons, neon signs, and electric vending machines.

Science News Letter, February 14, 1953

ELECTRIC JUICER grinds up tough vegetables into a pint of liquid in two minutes. Pulp from celery, carrots, apples, spinach, cabbage and other vegetables and fruits is separated from the juice by a built-in strainer. The rugged device is powered by

a quiet motor that is completely enclosed for safety.

Science News Letter, February 14, 1953

GRASS SPRINKLER attachment for garden hoses features a special cast-iron base that rests evenly on two edges, keeping grass from being mashed beneath it. The sprinkler's rotating arms are made of copper-clad tubing coated with a tough butyrate plastic. Nozzles on the whirling arms can be adjusted to throw water in any direction.

Science News Letter, February 14, 1953

RESEALING TOOL for the kitchen allows the housewife to put metal bottle caps back on the bottles of carbonated beverages factory-tight. The device opens and then reseals bottles so that the liquids "retain for indefinite periods" their sparkle, flavor and zest.

Science News Letter, February 14, 1953

FREEZER KIT provides the housewife with packaging materials for freezing foods in the home. The kit includes assorted cartons, plastic bags and boxes, poultry bags, aluminum foil, a marking pencil, freezer tape, an ice-cream scoop, 50 sucker sticks, a funnel and a 32-page booklet describing freezing techniques. The plastic boxes have tiny "legs" which let cold air circulate completely around the containers.

Science News Letter, February 14, 1953

# • Nature Ramblings •

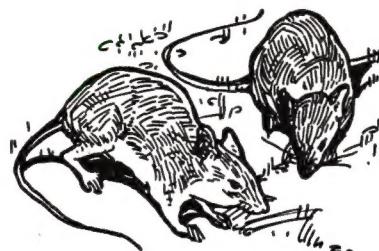
BESIDES THE animals he keeps in or about his house as working partners, food sources or pets, man has an assorted array of hangers-on that have lived with him so long that their common names reflect the association. As a rule, these names are indications of the part of man's habitat they have chosen to be their habitat as well.

"House," the widest and most inclusive of man's habitat-names, has been added as an adjective to the names of quite a diverse list: house mouse, house cricket, housefly, house sparrow, house wren, and, in the tropics at least, house snake.

Parts of the house, or of its outbuildings, have also been incorporated into animal names: chimney swift, wall lizard, bedbug, barn owl, barn swallow, stable fly. And since a ship is in a sense a floating house, perhaps shipworm should be included in this category.

Some smaller animal forms have become so characteristic as infestants of man's pre-

## Undomestic Animals



pared foods and fabrics that they are named for them. One thinks readily of such disconcerting beasties as cheese skipper and cheese mite, flour beetle and mealworm, and that humble worm dignified as the vinegar eel. Add also clothes moth, carpet beetle and book-louse.

Many persons, too squeamish to call a cockroach a cockroach, call it a waterbug, not so much because of any aquatic pref-

erences on its part as because this particular pest seems to invade houses by way of plumbing lines and sewers.

Less artificial than houses and barns but still man-made rearrangements of nature are his gardens, orchards and other plantings. These parts of the human habitat also have their characteristically-named fauna: orchard oriole, garden snail, garden snake, garden spider, hedge sparrow, hedgehog and field mouse.

Obviously, these unbidden guests in and around man's house receive the widest imaginable degrees of welcome. Orchard oriole and house wren we are always glad to see; house mouse and house sparrow are barely tolerated nuisances; housefly and clothes moths are intolerable pests. But whether we like them or not, most of them have been with us a long time, and they are more than likely to remain with us for a long time to come.

Science News Letter, February 14, 1953